Information Regarding Pediatric CT Scans and Radiation

The Department of Diagnostic Imaging and Radiology at T.C. Thompson Children’s Hospital promotes radiation safety for children undergoing imaging procedures. The following information is to help parents and caregivers understand some of the issues surrounding this topic.

**What is an X-ray?**

X-rays are beams of radiation that are invisible and pass through the body to create pictures. Bones and soft tissue can stop some of the x-rays, creating “shadows” on the film. This results in pictures that look at bones, lungs, and some organs. X-rays are not painful but do require your child to lie still while the picture is being taken. Parents can usually be in the room while the images are taken and can help keep their child comfortable. Radiologic technologists (RT) are medical professionals carefully trained to properly position, collimate and use shielding on your child when appropriate. Caregivers, when present, wear protective shielding (such as aprons) to decrease unnecessary radiation exposure. Women who are pregnant should inform the RT and avoid radiation exposure by staying out of the room during the x-ray exam.

**How much radiation is used in these exams?**

We all are exposed to small amounts of radiation daily from the sun. This is called background radiation. The closer we are to the sun, the more background radiation we are exposed to. Radiation can be measured in many ways. Measurements can estimate whole body dose or a dose to an individual organ and are very variable. One way of looking at dose comparisons is to measure effective dose using milliSievert units (mSv).

**Estimated Effective Dose (mSv)**

Natural background radiation 3.5 mSv /year Airline passenger .03 mSv

Chest X-ray (1 view) up to .01 mSv Chest X-ray (2 view) up to .1 mSv

Chest CT up to 3 mSv

**What are the risks from medical radiation?**

For many years that doctors, scientists and medical imaging physicists have studied this question, and there have been very different opinions. A recent study from Pearce et al *( Lancet* DOI 10.1016/S0140-0736(12)60815-0\_) suggests that there is a very small risk from CT scans in children based on their study which spanned the early 1980’s through 2008. If we follow the Image Gently (a campaign that promotes radiation protection for children) philosophy of being cautious, and perform imaging tests only when necessary and at the lowest possible radiation dose to answer the clinical question, then the medical benefit likely outweighs any small risk.

**How can we minimize radiation risk to my child?**

There are several ways to ensure that your child is exposed to the least amount of radiation.

* Image when there is a clear medical benefit
* Use the lowest amount of radiation for imaging based on size of the child to answer the medical question
* Image only the indicated area using proper positioning and shielding when possible
* Use alternative diagnostic studies when possible such as ultrasound or magnetic resonance scans
* Keep a record of your child’s past imaging tests. The Image Gently medical imaging record card on the website (www.imagegently.org) can be used for this purpose.

**If parents still have concerns regarding medical imaging tests, who should they talk to?**

First ask the doctor who requested your child’s test. The radiology staff at T.C. Thompson Children’s Hospital promote radiation safety and are also here to answer questions. You can also visit the Image Gently website that provides free information for parents and caregivers ( [www.imagegently.org](http://www.imagegently.org)).